What is claimed is:

sub A1 1. An integral structure comprising a base element and plurality of microneedles formed thereon, wherein said base element has a first side and a second side;

said plurality of microneedles comprising a plurality of projections which extend from the second side of said base element along longitudinal axes exhibiting at least one angle with respect to said base element; and

said plurality of projections being spaced apart from one another at a substantially predetermined separation distance, and said plurality of projections having a substantially uniform length, wherein:

said substantially predetermined separation distance is within a range of 50-1000 microns, and said substantially uniform length is within a range of 50-3000 microns.

2. The integral structure as recited in claim 1, wherein said plurality of projections comprises a plurality of hollow elements, and wherein said substantially predetermined separation distance is within a range of 50-300 microns, and said substantially uniform length is within a range of 50-200 microns.

3. The integral structure as recited in claim 2, wherein said plurality of hollow elements each comprise an outer diameter in the range of 20-100 microns.

4. The integral structure as recited in claim 3, wherein said plurality of hollow elements each exhibit a substantially circular outer contour in a transverse plane that is substantially perpendicular to a longitudinal axis of said hollow element; and wherein said substantially predetermined separation distance is within a range of 100-200 microns, said substantially uniform length is within a range of 100-150 microns, and said plurality of hollow elements each comprise an outer diameter in the range of 20-50 microns.

5. The integral structure as recited in claim 3, wherein said plurality of hollow elements each exhibit an edged outer contour, in a transverse plane that is substantially

perpendicular to a longitudinal axis of said hollow element, said outer contour having at least two sharp projections proximal to an end of the hollow element that is distal from said base element; and wherein said substantially predetermined separation distance is within a range of 100-200 microns, said substantially uniform length is within a range of 80-150 microns, and said plurality of hollow elements each comprise an outer diameter in the range of 20-50 microns.

6. The integral structure as recited in claim 4, wherein at least one of said longitudinal axes of said microneedles is in alignment with one of a plurality of first openings in the second side of said base element; and wherein said hollow elements of said plurality of microneedles allow liquid to flow therethrough between a plurality of second openings at a distal end of said hollow elements and said first openings at the second side of said base element; and a container structure comprising a reservoir capable of holding a liquid.

7. The integral structure as recited in claim 5, wherein at least one of said longitudinal axes of said microneedles is in alignment with one of a plurality of first openings in the second side of said base element; and wherein said hollow elements of said plurality of microneedles allow liquid to flow therethrough between a plurality of second openings at a distal end of said hollow elements and said first openings at the second side of said base element; and a container structure comprising a reservoir capable of holding a liquid.

8. The integral structure as recited in claim 1, wherein said plurality of projections comprises a plurality of solid elements, and wherein said substantially predetermined separation distance is within a range of 50-300 microns, and said substantially uniform length is within a range of 50-200 microns.

9. The integral structure as recited in claim 8, wherein said plurality of solid elements each comprise a plurality of edged blades having a radius dimension, from a longitudinal axis of said solid elements, in the range of 10-50 microns.

10. The integral structure as recited in claim 9, wherein said plurality of solid elements each exhibit a substantially star-shaped outer contour in a transverse plane that is substantially perpendicular to the longitudinal axis of said solid element; and wherein said substantially predetermined separation distance is within a range of 100-200 microns, said substantially uniform length is within a range of 80-150 microns, and said plurality of solid elements each comprise a blade radius in the range of 10-15 microns.

11. The integral structure as recited in claim 10, wherein at least one of said longitudinal axes of said microneedles is located proximal to a plurality of openings in the second side of said base element; and wherein said plurality of microneedles allows liquid to flow along their outer surfaces through said openings at the second side of said base element; and a container structure comprising a reservoir capable of holding a liquid.

12. The integral structure as recited in claim 1, wherein each microneedle element is constructed of one of: a metal material manufactured by a micromachining process, a plastic material manufactured by a micromolding process, or a semiconductive material manufactured by a semiconductor fabrication process.

13. An integral structure comprising a base element and plurality of microneedles formed thereon, wherein said base element has a first side and a second side;

said plurality of microneedles comprising a plurality of projections which extend from the second side of said base element along longitudinal axes exhibiting at least one angle with respect to said base element; and

said plurality of projections being spaced apart from one another at an average separation distance, and said plurality of projections having an average length, wherein:

said average separation distance is within a range of 50-1000 microns, and said average length is within a range of 50-3000 microns.

14. The integral structure as recited in claim 13, wherein said plurality of projections comprises a plurality of hollow elements, and wherein said average separation distance is within a range of 50-300 microns, and said average length is within a range of 50-200 microns.

15. The integral structure as recited in claim 14, wherein said plurality of hollow elements each comprise an outer diameter in the range of 20-100 microns.

16. The integral structure as recited in claim 15, wherein said plurality of hollow elements each exhibit a substantially circular outer contour in a transverse plane that is substantially perpendicular to a longitudinal axis of said hollow element; and wherein said average separation distance is within a range of 100-200 microns, said average length is within a range of 100-150 microns, and said plurality of hollow elements each comprise an outer diameter in the range of 20-50 microns.

17. The integral structure as recited in claim 15, wherein said plurality of hollow elements each exhibit an edged outer contour, in a transverse plane that is substantially perpendicular to a longitudinal axis of said hollow element, said outer contour having at least two sharp projections proximal to an end of the hollow element that is distal from said base element; and wherein said average separation distance is within a range of 100-200 microns, said average length is within a range of 80-150 microns, and said plurality of hollow elements each comprise an outer diameter in the range of 20-50 microns.

18. The integral structure as recited in claim 16, wherein at least one of said longitudinal axes of said microneedles is in alignment with one of a plurality of first openings in the second side of said base element; and wherein said hollow elements of said plurality of microneedles allow liquid to flow therethrough between a plurality of

second openings at a distal end of said hollow elements and said first openings at the second side of said base element; and a container structure comprising a reservoir capable of holding a liquid.

19. The integral structure as recited in claim 17, wherein at least one of said longitudinal axes of said microneedles is in alignment with one of a plurality of first openings in the second side of said base element; and wherein said hollow elements of said plurality of microneedles allow liquid to flow therethrough between a plurality of second openings at a distal end of said hollow elements and said first openings at the second side of said base element; and a container structure comprising a reservoir capable of holding a liquid.

20. The integral structure as recited in claim 13, wherein said plurality of projections comprises a plurality of solid elements, and wherein said average separation distance is within a range of 50-300 microns, and said average length is within a range of 50-200 microns.

21. The integral structure as recited in claim 20, wherein said plurality of solid elements each comprise a plurality of edged blades having a radius dimension, from a longitudinal axis of said solid elements, in the range of 10-50 microns.

22. The integral structure as recited in claim 21, wherein said plurality of solid elements each exhibit a substantially star-shaped outer contour in a transverse plane that is substantially perpendicular to the longitudinal axis of said solid element; and wherein said average separation distance is within a range of 100-200 microns, said average length is within a range of 80-150 microns, and said plurality of solid elements each comprise a blade radius in the range of 10-15 microns.

23. The integral structure as recited in claim 22, wherein at least one of said longitudinal axes of said microneedles is located proximal to a plurality of openings in the

second side of said base element; and wherein said plurality of microneedles allows liquid to flow along their outer surfaces through said openings at the second side of said base element; and a container structure comprising a reservoir capable of holding a liquid.

24. The integral structure as recited in claim 13, wherein each microneedle element is constructed of one of: a metal material manufactured by a micromachining process, a plastic material manufactured by a micromolding process, or a semiconductive material manufactured by a semiconductor fabrication process.